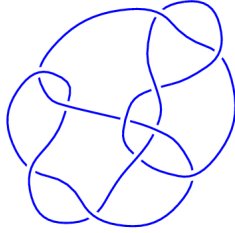
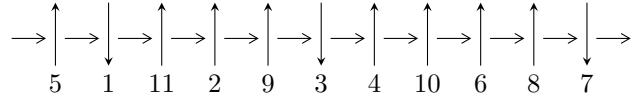


11a<sub>27</sub> (K11a<sub>27</sub>)

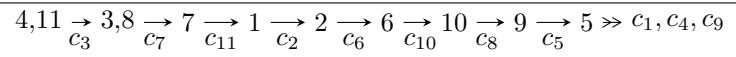


1

**Arc Sequences**



**Solving Sequence**



**Representation Ideals**

$$I = \bigcap_{i=1}^2 I_i^u$$

$$I_1^u = \langle u^2 + u + 1, b, a + u + 1 \rangle$$

$$I_2^u = \langle u^{73} + 2u^{72} + \dots - 784u + 224,$$

$$5.41969 \times 10^{257} u^{72} - 2.81275 \times 10^{256} u^{71} + \dots + 8.46748 \times 10^{259} b - 2.77370 \times 10^{259},$$

$$- 7.43384 \times 10^{258} u^{72} - 1.34318 \times 10^{259} u^{71} + \dots + 5.92724 \times 10^{260} a - 1.00426 \times 10^{262} \rangle$$

There are 2 irreducible components with 75 representations.

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<sup>1</sup>The knot diagram image is adapter from “C. Livingston and A. H. Moore, KnotInfo: Table of Knot Invariants, <http://www.indiana.edu/~knotinfo>”

$$\mathbf{I. } I_1^u = \langle u^2 + u + 1, b, a + u + 1 \rangle$$

**(i) Arc colorings**

$$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -u - 1 \\ 0 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -u \\ u \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -2u - 1 \\ u \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -u - 1 \\ u + 1 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -u - 1 \\ u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -u - 1 \\ 2u \end{pmatrix}$$

$$a_5 = \begin{pmatrix} u + 1 \\ -u \end{pmatrix}$$

$$a_5 = \begin{pmatrix} u + 1 \\ -u \end{pmatrix}$$

**(ii) Obstruction class = 1**

**(iii) Cusp Shapes =unknown**

(iv) Complex Volumes and Cusp Shapes

Solution to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.500000 - 0.866025I$		
$a = -0.500000 + 0.866025I$	$1.64493 - 2.02988I$	$9.00000 + 3.46410I$
$b = 0$		
$u = -0.500000 + 0.866025I$		
$a = -0.500000 - 0.866025I$	$1.64493 + 2.02988I$	$9.00000 - 3.46410I$
$b = 0$		

$$\text{II. } I_2^u = \langle u^{73} + 2u^{72} + \dots - 784u + 224, 5.42 \times 10^{257}u^{72} - 2.81 \times 10^{256}u^{71} + \dots + 8.47 \times 10^{259}b - 2.77 \times 10^{259}, -7.43 \times 10^{258}u^{72} - 1.34 \times 10^{259}u^{71} + \dots + 5.93 \times 10^{260}a - 1.00 \times 10^{262} \rangle$$

(i) Arc colorings

$$\begin{aligned} a_4 &= \begin{pmatrix} 1 \\ 0 \end{pmatrix} \\ a_{11} &= \begin{pmatrix} 0.0125418u^{72} + 0.0226611u^{71} + \dots - 49.8356u + 16.9432 \\ -0.00640059u^{72} + 0.000332183u^{71} + \dots - 3.00631u + 0.327571 \end{pmatrix} \\ a_3 &= \begin{pmatrix} 0.0435585u^{72} + 0.0509612u^{71} + \dots + 99.6072u - 21.4440 \\ -0.00973873u^{72} + 0.00503448u^{71} + \dots - 86.2725u + 20.1008 \end{pmatrix} \\ a_8 &= \begin{pmatrix} 0 \\ u \end{pmatrix} \\ a_7 &= \begin{pmatrix} -u \\ u \end{pmatrix} \\ a_1 &= \begin{pmatrix} 0.0185994u^{72} + 0.0349545u^{71} + \dots - 56.8573u + 19.3424 \\ -0.0124582u^{72} - 0.0119612u^{71} + \dots + 4.01534u - 2.07165 \end{pmatrix} \\ a_2 &= \begin{pmatrix} 0.0124116u^{72} + 0.0218431u^{71} + \dots + 7.44848u + 0.766620 \\ -0.0109037u^{72} - 0.0254418u^{71} + \dots + 11.9417u - 4.79598 \end{pmatrix} \\ a_6 &= \begin{pmatrix} 0.00257307u^{72} + 0.0246508u^{71} + \dots - 47.4396u + 15.9214 \\ -0.0305982u^{72} - 0.0677537u^{71} + \dots + 22.1281u - 11.4149 \end{pmatrix} \\ a_{10} &= \begin{pmatrix} 0.0125418u^{72} + 0.0226611u^{71} + \dots - 49.8356u + 16.9432 \\ -0.0128835u^{72} - 0.00785097u^{71} + \dots - 7.71495u + 0.870220 \end{pmatrix} \\ a_9 &= \begin{pmatrix} 0.0272494u^{72} + 0.0594532u^{71} + \dots - 10.6219u + 10.1246 \\ -0.0476397u^{72} - 0.0935743u^{71} + \dots + 10.4863u - 10.8669 \end{pmatrix} \\ a_5 &= \begin{pmatrix} -0.0197337u^{72} - 0.0592553u^{71} + \dots - 1.17499u - 1.97148 \\ 0.00317357u^{72} + 0.0240883u^{71} + \dots - 29.9329u + 8.71462 \end{pmatrix} \\ a_5 &= \begin{pmatrix} -0.0197337u^{72} - 0.0592553u^{71} + \dots - 1.17499u - 1.97148 \\ 0.00317357u^{72} + 0.0240883u^{71} + \dots - 29.9329u + 8.71462 \end{pmatrix} \end{aligned}$$

(ii) Obstruction class = -1

(iii) Cusp Shapes = unknown

(iv) Complex Volumes and Cusp Shapes

Solution to $I_2^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.12301 - 1.36301I$ $a = -0.868710 - 0.369423I$ $b = 0.99821 + 1.22701I$	$-4.1062 + 17.0192I$	$2.90782 - 10.28377I$
$u = -1.12301 + 1.36301I$ $a = -0.868710 + 0.369423I$ $b = 0.99821 - 1.22701I$	$-4.1062 - 17.0192I$	$2.90782 + 10.28377I$
$u = -1.073440 - 0.377264I$ $a = 0.155363 + 1.004890I$ $b = -0.18350 - 1.64558I$	$-0.261500 + 0.649592I$	$8.78620 - 3.09010I$
$u = -1.073440 + 0.377264I$ $a = 0.155363 - 1.004890I$ $b = -0.18350 + 1.64558I$	$-0.261500 - 0.649592I$	$8.78620 + 3.09010I$
$u = -1.054986 - 0.922796I$ $a = -0.920524 + 0.239448I$ $b = 0.904852 + 0.904984I$	$2.75520 + 10.95232I$	$7.44212 - 9.37085I$
$u = -1.054986 + 0.922796I$ $a = -0.920524 - 0.239448I$ $b = 0.904852 - 0.904984I$	$2.75520 - 10.95232I$	$7.44212 + 9.37085I$
$u = -1.00449 - 1.19281I$ $a = 0.692727 + 0.404704I$ $b = -0.85474 - 1.25657I$	$-2.75982 + 5.17856I$	$3.80134 - 2.28640I$
$u = -1.00449 + 1.19281I$ $a = 0.692727 - 0.404704I$ $b = -0.85474 + 1.25657I$	$-2.75982 - 5.17856I$	$3.80134 + 2.28640I$
$u = -0.771915 - 1.016807I$ $a = -1.097565 - 0.509906I$ $b = 1.09209 + 1.38351I$	$-8.19243 + 8.08051I$	$-0.92498 - 7.17495I$
$u = -0.771915 + 1.016807I$ $a = -1.097565 + 0.509906I$ $b = 1.09209 - 1.38351I$	$-8.19243 - 8.08051I$	$-0.92498 + 7.17495I$

Solution to $I_2^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.75672 - 1.70120I$ $a = -0.656800 - 0.121180I$ $b = 0.521307 + 0.447048I$	$-2.40217 + 4.04097I$	$-1.16757 - 7.09941I$
$u = -0.75672 + 1.70120I$ $a = -0.656800 + 0.121180I$ $b = 0.521307 - 0.447048I$	$-2.40217 - 4.04097I$	$-1.16757 + 7.09941I$
$u = -0.727699$ $a = -1.00090$ $b = 0.291116$	1.41721	6.25417
$u = -0.706305 - 0.439910I$ $a = -0.920408 + 0.281189I$ $b = 0.88728 - 1.14467I$	$2.29836 + 4.22810I$	$12.1430 - 9.3439I$
$u = -0.706305 + 0.439910I$ $a = -0.920408 - 0.281189I$ $b = 0.88728 + 1.14467I$	$2.29836 - 4.22810I$	$12.1430 + 9.3439I$
$u = -0.695071 - 0.959449I$ $a = -0.004634 + 0.185185I$ $b = -0.382619 - 0.469678I$	$0.75785 + 1.41365I$	$4.07014 - 4.97652I$
$u = -0.695071 + 0.959449I$ $a = -0.004634 - 0.185185I$ $b = -0.382619 + 0.469678I$	$0.75785 - 1.41365I$	$4.07014 + 4.97652I$
$u = -0.663769 - 0.462321I$ $a = -0.70947 + 1.65424I$ $b = 0.531987 + 0.577235I$	$2.41837 + 3.22713I$	$6.50397 - 8.13076I$
$u = -0.663769 + 0.462321I$ $a = -0.70947 - 1.65424I$ $b = 0.531987 - 0.577235I$	$2.41837 - 3.22713I$	$6.50397 + 8.13076I$
$u = -0.587100 - 0.723419I$ $a = 0.198283 - 0.518162I$ $b = -0.623940 - 0.811732I$	$0.57464 + 2.49330I$	$4.09751 - 3.36278I$

Solution to $I_2^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.587100 + 0.723419I$ $a = 0.198283 + 0.518162I$ $b = -0.623940 + 0.811732I$	$0.57464 - 2.49330I$	$4.09751 + 3.36278I$
$u = -0.548650 - 1.015824I$ $a = -1.284021 - 0.238994I$ $b = 0.413663 + 0.746665I$	$-2.97910 + 4.50576I$	$3.61990 - 4.22524I$
$u = -0.548650 + 1.015824I$ $a = -1.284021 + 0.238994I$ $b = 0.413663 - 0.746665I$	$-2.97910 - 4.50576I$	$3.61990 + 4.22524I$
$u = -0.401941 - 0.804946I$ $a = -0.897223 + 0.360889I$ $b = 0.955416 + 0.688471I$	$-1.56864 + 4.14463I$	$2.64822 - 8.01358I$
$u = -0.401941 + 0.804946I$ $a = -0.897223 - 0.360889I$ $b = 0.955416 - 0.688471I$	$-1.56864 - 4.14463I$	$2.64822 + 8.01358I$
$u = -0.31676 - 3.10066I$ $a = 0.420952 + 0.129401I$ $b = -0.525473 - 0.263881I$	$-3.18426 - 5.39888I$	$5.84795 - 9.57058I$
$u = -0.31676 + 3.10066I$ $a = 0.420952 - 0.129401I$ $b = -0.525473 + 0.263881I$	$-3.18426 + 5.39888I$	$5.84795 + 9.57058I$
$u = -0.31454 - 3.49405I$ $a = -0.002735 + 0.185466I$ $b = -0.020347 - 0.290364I$	$1.30311 - 2.11076I$	$-42.0323 - 9.8539I$
$u = -0.31454 + 3.49405I$ $a = -0.002735 - 0.185466I$ $b = -0.020347 + 0.290364I$	$1.30311 + 2.11076I$	$-42.0323 + 9.8539I$
$u = -0.211879 - 0.584703I$ $a = -0.450705 + 0.007341I$ $b = -0.575775 - 0.413622I$	$0.76514 + 1.25127I$	$5.38460 - 5.06088I$

Solution to $I_2^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.211879 + 0.584703I$ $a = -0.450705 - 0.007341I$ $b = -0.575775 + 0.413622I$	$0.76514 - 1.25127I$	$5.38460 + 5.06088I$
$u = -0.199476 - 0.702761I$ $a = -0.27447 + 1.92998I$ $b = 0.134422 + 0.525881I$	$1.11279 - 1.68465I$	$-4.96907 - 2.48353I$
$u = -0.199476 + 0.702761I$ $a = -0.27447 - 1.92998I$ $b = 0.134422 - 0.525881I$	$1.11279 + 1.68465I$	$-4.96907 + 2.48353I$
$u = -0.196172 - 0.545724I$ $a = -2.42765 - 0.23693I$ $b = 1.62844 - 0.90039I$	$-2.67029 + 8.34069I$	$4.38270 - 11.12769I$
$u = -0.196172 + 0.545724I$ $a = -2.42765 + 0.23693I$ $b = 1.62844 + 0.90039I$	$-2.67029 - 8.34069I$	$4.38270 + 11.12769I$
$u = -0.122145 - 0.591196I$ $a = 2.45996 + 0.27818I$ $b = -0.061707 - 0.909666I$	$-6.72947 - 4.09633I$	$-3.14446 + 4.83546I$
$u = -0.122145 + 0.591196I$ $a = 2.45996 - 0.27818I$ $b = -0.061707 + 0.909666I$	$-6.72947 + 4.09633I$	$-3.14446 - 4.83546I$
$u = -0.096382 - 1.059678I$ $a = 1.150597 - 0.231346I$ $b = -0.234833 - 0.948799I$	$-6.08025 + 2.66865I$	$-2.56867 - 3.42709I$
$u = -0.096382 + 1.059678I$ $a = 1.150597 + 0.231346I$ $b = -0.234833 + 0.948799I$	$-6.08025 - 2.66865I$	$-2.56867 + 3.42709I$
$u = 0.099814 - 0.392098I$ $a = -2.83754 + 0.89871I$ $b = 1.60921 + 0.66159I$	$-3.09906 - 2.70236I$	$2.89632 + 5.58014I$



Solution to $I_2^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.099814 + 0.392098I$ $a = -2.83754 - 0.89871I$ $b = 1.60921 - 0.66159I$	$-3.09906 + 2.70236I$	$2.89632 - 5.58014I$
$u = 0.152205 - 0.282535I$ $a = 3.71687 - 0.84191I$ $b = -1.62722 - 0.22397I$	$0.69933 - 2.58301I$	$11.91137 + 2.89959I$
$u = 0.152205 + 0.282535I$ $a = 3.71687 + 0.84191I$ $b = -1.62722 + 0.22397I$	$0.69933 + 2.58301I$	$11.91137 - 2.89959I$
$u = 0.251013 - 1.024044I$ $a = 1.59999 + 0.14403I$ $b = -0.412283 + 0.874957I$	$-4.88061 - 8.78731I$	$0.32196 + 9.11237I$
$u = 0.251013 + 1.024044I$ $a = 1.59999 - 0.14403I$ $b = -0.412283 - 0.874957I$	$-4.88061 + 8.78731I$	$0.32196 - 9.11237I$
$u = 0.269009 - 0.408888I$ $a = 3.05631 - 1.40140I$ $b = -0.214868 + 0.856112I$	$-6.25965 - 2.30457I$	$-2.36678 + 1.26889I$
$u = 0.269009 + 0.408888I$ $a = 3.05631 + 1.40140I$ $b = -0.214868 - 0.856112I$	$-6.25965 + 2.30457I$	$-2.36678 - 1.26889I$
$u = 0.34736 - 2.81362I$ $a = 0.454897 - 0.005069I$ $b = -0.584992 + 0.148286I$	$-3.36772 - 0.28806I$	$8.2957 + 11.4804I$
$u = 0.34736 + 2.81362I$ $a = 0.454897 + 0.005069I$ $b = -0.584992 - 0.148286I$	$-3.36772 + 0.28806I$	$8.2957 - 11.4804I$
$u = 0.349807 - 1.049909I$ $a = -1.039581 + 0.270557I$ $b = 0.225312 - 0.818115I$	$-3.74839 + 1.23253I$	$1.83312 - 1.85392I$

Solution to $I_2^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.349807 + 1.049909I$ $a = -1.039581 - 0.270557I$ $b = 0.225312 + 0.818115I$	$-3.74839 - 1.23253I$	$1.83312 + 1.85392I$
$u = 0.352818 - 0.985323I$ $a = -0.395836 - 0.276475I$ $b = 0.457094 - 0.889285I$	$-3.66692 - 0.65369I$	$-3.56200 + 0.87256I$
$u = 0.352818 + 0.985323I$ $a = -0.395836 + 0.276475I$ $b = 0.457094 + 0.889285I$	$-3.66692 + 0.65369I$	$-3.56200 - 0.87256I$
$u = 0.55855 - 2.25389I$ $a = -0.485906 + 0.242323I$ $b = 0.421934 - 0.489041I$	$-2.39394 + 1.31325I$	$-3.63687 + 2.32909I$
$u = 0.55855 + 2.25389I$ $a = -0.485906 - 0.242323I$ $b = 0.421934 + 0.489041I$	$-2.39394 - 1.31325I$	$-3.63687 - 2.32909I$
$u = 0.599679 - 0.261791I$ $a = 0.86479 + 1.79489I$ $b = -0.685403 + 0.478823I$	$3.44487 + 1.41386I$	$10.83320 + 0.26593I$
$u = 0.599679 + 0.261791I$ $a = 0.86479 - 1.79489I$ $b = -0.685403 - 0.478823I$	$3.44487 - 1.41386I$	$10.83320 - 0.26593I$
$u = 0.702214 - 1.085511I$ $a = -0.898238 + 0.518500I$ $b = 0.94267 - 1.39992I$	$-8.72144 - 2.03741I$	$-2.06720 + 1.77059I$
$u = 0.702214 + 1.085511I$ $a = -0.898238 - 0.518500I$ $b = 0.94267 + 1.39992I$	$-8.72144 + 2.03741I$	$-2.06720 - 1.77059I$
$u = 0.704933 - 0.862455I$ $a = -0.326461 - 0.533891I$ $b = 0.626006 - 0.900852I$	$-1.24065 - 7.33132I$	$0.88010 + 7.59105I$

Solution to $I_2^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.704933 + 0.862455I$ $a = -0.326461 + 0.533891I$ $b = 0.626006 + 0.900852I$	$-1.24065 + 7.33132I$	$0.88010 - 7.59105I$
$u = 0.718334 - 0.034783I$ $a = 1.170911 - 0.016850I$ $b = -1.09050 + 1.02689I$	$4.06916 - 1.66774I$	$17.5628 + 3.8525I$
$u = 0.718334 + 0.034783I$ $a = 1.170911 + 0.016850I$ $b = -1.09050 - 1.02689I$	$4.06916 + 1.66774I$	$17.5628 - 3.8525I$
$u = 0.857855 - 0.206337I$ $a = -0.0945515 + 0.0017358I$ $b = 0.625708 - 0.391085I$	$-0.16446 + 2.80927I$	$2.04943 - 2.04126I$
$u = 0.857855 + 0.206337I$ $a = -0.0945515 - 0.0017358I$ $b = 0.625708 + 0.391085I$	$-0.16446 - 2.80927I$	$2.04943 + 2.04126I$
$u = 1.00254 - 1.34079I$ $a = -0.719486 + 0.325890I$ $b = 0.90851 - 1.22268I$	$-5.08354 - 10.84059I$	$1.35643 + 5.82505I$
$u = 1.00254 + 1.34079I$ $a = -0.719486 - 0.325890I$ $b = 0.90851 + 1.22268I$	$-5.08354 + 10.84059I$	$1.35643 - 5.82505I$
$u = 1.004968 - 0.736127I$ $a = 0.945284 + 0.222410I$ $b = -0.942016 + 0.894877I$	$4.44539 - 5.47964I$	$10.52914 + 5.00212I$
$u = 1.004968 + 0.736127I$ $a = 0.945284 - 0.222410I$ $b = -0.942016 - 0.894877I$	$4.44539 + 5.47964I$	$10.52914 - 5.00212I$
$u = 1.096408 - 0.249087I$ $a = 0.557924 - 1.029705I$ $b = -0.54381 + 1.69143I$	$0.01661 - 5.97370I$	$9.92070 + 8.84627I$

Solution to $I_2^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.096408 + 0.249087I$ $a = 0.557924 + 1.029705I$ $b = -0.54381 - 1.69143I$	$0.01661 + 5.97370I$	$9.92070 - 8.84627I$
$u = 1.14109 - 1.18189I$ $a = 0.868102 - 0.447299I$ $b = -0.96563 + 1.27526I$	$-1.84899 - 11.18435I$	$5.28704 + 6.93589I$
$u = 1.14109 + 1.18189I$ $a = 0.868102 + 0.447299I$ $b = -0.96563 - 1.27526I$	$-1.84899 + 11.18435I$	$5.28704 - 6.93589I$

### III. u-Polynomials

Crossings	u-Polynomials at each crossings
$c_1$	$(u^2 + u + 1)(u^{73} + 2u^{72} + \dots + 7u - 1)$
$c_2$	$(u^2 + u + 1)(u^{73} + 32u^{72} + \dots + 131u - 1)$
$c_3$	$u^2(u^{73} + 7u^{72} + \dots + 12u + 4)$
$c_4$	$(u^2 - u + 1)(u^{73} + 2u^{72} + \dots + 7u - 1)$
$c_5$	$(u + 1)^2(u^{73} + 3u^{72} + \dots + 8u + 1)$
$c_6$	$(u^2 - u + 1)(u^{73} + 34u^{71} + \dots - 149u - 41)$
$c_7$	$(u^2 - u + 1)(u^{73} + 2u^{72} + \dots - 784u + 224)$
$c_8$	$(u + 1)^2(u^{73} + 23u^{72} + \dots - 2u + 1)$
$c_9$	$(u - 1)^2(u^{73} + 3u^{72} + \dots + 8u + 1)$
$c_{10}$	$(u - 1)^2(u^{73} + 23u^{72} + \dots - 2u + 1)$
$c_{11}$	$(u - 1)^2(u^{73} + 7u^{72} + \dots + u^2 + 1)$

#### IV. Riley Polynomials

Crossings	Riley Polynomials at each crossings
$c_1, c_4$	$(y^2 + y + 1)(y^{73} + 32y^{72} + \dots + 131y - 1)$
$c_2$	$(y^2 + y + 1)(y^{73} + 20y^{72} + \dots + 19907y - 1)$
$c_3$	$y^2(y^{73} + 15y^{72} + \dots - 344y - 16)$
$c_5$	$1.00000000000000(1y - 1.00000000000000)^2$ $(1.00y^{73} - 23.0y^{72} + \dots - 2.00y - 1.00)$
$c_6$	$(y^2 + y + 1)(y^{73} + 68y^{72} + \dots - 11173y - 1681)$
$c_7$	$(y^2 + y + 1)(y^{73} + 84y^{72} + \dots - 1858304y - 50176)$
$c_8, c_{10}$	$(y - 1)^2(y^{73} + 57y^{72} + \dots + 254y - 1)$
$c_9$	$1.00000000000000(1y - 1.00000000000000)^2$ $(1.00y^{73} - 23.0y^{72} + \dots - 2.00y - 1.00)$
$c_{11}$	$(y - 1)^2(y^{73} + 5y^{72} + \dots - 2y - 1)$